

Invention Disclosure

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Inventor: Curtis Jude Martin
Address: 1640 Franklin Avenue - Kent, Ohio 44240-4383 - USA
Title of Invention: E.V.E. emergency vehicle environment

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BACKGROUND OF THE INVENTION

1. Field of the Invention

This invention creates an Emergency Vehicle Environment ("EVE") for unobstructing the path of emergency vehicles resulting in increased response times and safety. This Emergency Vehicle Environment is intentionally created with small, inexpensive, dedicated-channel, analog-based, FM radio devices. The receiving devices include a stand-alone, miniature, dedicated-channel, analog-based, FM radio receiver placed in (such as on the dashboard) a non-emergency vehicle (hereinafter the "EVE Mini-Receiver"), an integrated, miniature, dedicated-channel, analog-based, FM radio receiver placed in (such as in the dashboard) a non-emergency vehicle (hereinafter the "EVE Icon-Receiver"), and a dedicated-channel, analog-based, FM radio receiver housed in a conventional traffic light fixture or similarly appearing

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Inventor: Curtis J. Martin Date: 8/7/04 Application/Control No.:
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Rashley Steel Date: 8-07-04 Group Art Unit: 2632
Sue Conery Date: 8/9/04 Examiner: Daniel Previl

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fixture (hereinafter the "EVE Traffic-Receiver"). These EVE Receivers actuate an intermittent (blinking or strobe), warning light when a signal is transmitted from a dedicated-channel, analog-based, FM radio transmitter placed in the interior (such as on the dashboard) or on the exterior (such as the light bar) of an emergency vehicle (hereinafter the "EVE Transmitter"). The EVE Transmitter is manually activated, or by employing its condenser microphone, automatically actuated by the use of the siren in the emergency vehicle. The EVE Transmitter controls its transmission signal by employing an accelerometer and a directional antenna.

The current system for clearing the path of emergency vehicles is the combined use of sirens and flashers. The sirens are not heard until the emergency vehicle is very close, if at all; The flashers are not seen by drivers going the same direction until rear view mirrors are checked, if at all. The present invention

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transduces the emergency vehicle's siren to a strobe/blingking light(s) already in all of the drivers' lines of sight.

The problems with the said current system are illustrated with an aerial view in FIG. 1. The emergency vehicle 1 has relatively clearer passage on the more dangerous, opposite side of the road since the oncoming non-emergency vehicles 2 can see the flashers. The non-emergency vehicles 3 in the same lane and closer have no direct visual warning and are slower to pull over, due to having to hear the siren and then see the flashers in rear view mirrors. The non-emergency vehicles 4 are stopped at the intersection's red traffic light 6 and are obstructing the path usurping time. The non-emergency vehicles 5 are the most dangerous since they are entering the intersection with a green traffic light 6 and are not aware of the sirens and flashers.

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The solution that this invention affords is illustrated with an aerial view in FIG. 2. The emergency vehicle 7 has clear passage on either side of the road since all non-emergency vehicles have visual confirmation of an emergency vehicle's approach from their EVE mini-receivers or EVE icon-receivers in their non-emergency vehicle's interiors and/or from the EVE traffic-receiver in the intersection 11. None of the non-emergency vehicles has to rely on direct sensory perception of the emergency vehicle's sirens and/or flashers. The non-emergency vehicles 8 that were stopped at the intersection's red traffic light are now pulled over. The non-emergency vehicles 9, previously the most dangerous, are now the least dangerous. Non-emergency vehicles 10 that need not be inconvenienced are not.

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2. Related Prior Art

The following prior art references have relevant excerpts in quotations. The excerpts contain some of the differences between the prior art and this invention.

Hamer Patents, U.S. Pat. Nos. 5,187,476 & 5,202,683,

Title: Optical traffic preemption detector

"An optical traffic preemption detector (hereinafter "Opticom") detects pulses of light emitted by an approaching emergency vehicle and provides an output signal which is processed by a phase selector. The phase selector can request a traffic signal controller to preempt a normal traffic signal sequence to give priority to the emergency vehicle. A detector assembly is mounted in proximity to an intersection and can have multiple detector channels. A detector channel can have multiple photocells."

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Opticom employs remote relays; The EVE Transmitter and EVE Traffic-Receiver save this cost. Opticom's receiver can be obstructed by trucks, buildings, etc.; The EVE Traffic-Receiver is not. Opticom's transmitter should not be activated when the emergency vehicle is facing the wrong direction; The EVE Transmitter can be activated immediately. Opticom can block another emergency vehicle's different approach with a red light and stopped traffic; This invention does not block other emergency vehicles. Opticom can take up to fifteen seconds to change a traffic light; The EVE Traffic-Receiver activates immediately. Opticom does not alert drivers of an emergency vehicle's approach by changing traffic lights; This invention does, including the twenty-one million deaf and hard of hearing in just the U.S. alone. The Opticom transmitter requires manually turning off and on, since it cannot be automatic because of its limitations; The EVE Transmitter is activated

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automatically. The Opticom system only applies to intersections; This invention applies to all roadways. Opticom costs much more than this invention and Opticom does much less.

Prevulsky Patent, U.S. Pat. No. 5,307,060,

Title: Emergency vehicle alert system

"An emergency vehicle alert system provides a transceiver ... transceiver alternates between emergency vehicle alert signal transmission and a receiving function ... The transceiver produces a signal having encoded information which identifies the emergency vehicle type."

The Prevulsky Patent employs a transceiver where this invention employs a transmitter. The EVE Transmitter employs an accelerometer to increase or decrease its signal's range in accordance with the speed of the emergency vehicle; The Prevulsky Patent does not. The EVE Transmitter employs a

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✓ directional antenna so that the signal is only sent to non-emergency vehicles in the path of the emergency vehicle; The Prevulsky Patent's transceiver alerts every non-emergency vehicle within the emergency vehicle's radius. This will result in the majority of non-emergency vehicles, alerted by the Prevulsky Patent, in being unnecessarily alerted, resulting in a disrespect/disregard for all of its alerts. The EVE Transmitter's combination of accelerometer and directional antenna assures non-emergency vehicles that an emergency vehicle is coming their way and coming now.

Carr Patent, U.S. Pat. No. 5,739,767,

Title: Vehicle safety warning system

"... a vehicle warning system device that is capable of detecting sirens of approaching emergency vehicles. This device includes a plurality of siren detectors, ... A plurality of visual indicators and a speaker. A microprocessor having a microprocessor

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plurality of input, a microprocessor plurality of output and a microprocessor memory."

Mulanax Patent, U.S. Pat. No. 5,808,560,

Title: Emergency vehicle alert apparatus

" ... for identifying the presence of an emergency vehicle in the immediate vicinity of a motor vehicle. ... The apparatus comprises: a transmitting unit, ... producing a digital data stream which is connected to a broadcast antenna; and, a receiving unit, ... that demodulates a received digital data stream and then activates an alert pulse generator which is connected to an alarm means if the digital identification code matches the digital identification encoded in the transmitting unit."

Greneker, III Patent, U.S. Pat. No. 5,917,430,

Title: Radar based highway safety warning system

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"A system for transmitting messages, such as safety hazard warning messages, to vehicles causes alerts to be generated in conventional radar detectors and more detailed messages to be provided to drivers with message capable radar receivers."

The Gréneker Patent employs radar technology; This invention employs analog-based, FM radio technology. The radar receivers cost forty to one hundred times as much as the EVE Icon-Receiver and EVE Mini-Receiver. The radar receivers are not cost-effective; This invention is.

Hartzell Patent, U.S. Pat. No. 5,926,112,

Title: Emergency vehicle warning system

"... for warning vehicles of the approach of an emergency vehicle. ... a single message screen on a front of the receiver, the single message screen including graphical representations of emergency

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vehicles ... adapted to illuminate one of said graphical representations ... a speaker ..."

Ellis Patent, U.S. Pat. No. 5,973,618,

Title: The Intelligent Walking Stick

"A portable safety mechanism housed in a cane, a walking stick or a belt-carried housing. In each of such embodiments, the portable safety mechanism includes a processor, a transmitter, a receiver, and an outside image sensor or scanner, a warning device such as an audible warning device or warning light. The scanner may, for example, sense the shape of a traffic signal or the color of a traffic signal."

Markow Patent, U.S. Pat. No. 6,087,961, Title:

Directional warning system for detecting emergency vehicles

"A system for warning motorists of the presence of an emergency vehicle is provided. ... The system also includes a direction

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finding antenna adapted to be coupled to the vehicle of a
motorist's vehicle, a receiver coupled to the direction finding
antenna and adapted for receiving the emergency signal and
producing a directional signal in response thereto, and an audio
system for generating an audio playback signal which identifies
the presence of the emergency vehicle as well as the relative
direction between it and the motorist's vehicle. "

The Markow Patent's receiver employs a direction finding antenna; The EVE Transmitter employs a directional antenna. The ratio of non-emergency vehicles to emergency vehicles is substantial, therefore the ratio of receivers to transmitters is substantial, and therefore the Markow Patent's system costs substantially more than the current invention.

Henry Patent, U.S. Pat. No. 6,094,148,

Title: Vehicular emergency vehicle alarm apparatus

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"An apparatus for detecting vehicular speed monitoring signals and for detecting nearby emergency vehicles includes a first sensor for sensing modulated light from an emergency vehicle warning light and generating an alarm signal in response; a second sensor for sensing an incident vehicular speed monitoring signal and generating a ranging signal in response; and an alarm coupled to the first and second sensors for issuing an alarm in response to generation of any of the ranging signal and the alarm signal. "

Smith Patent, U.S. Pat. No. 6,160,493,

Title: Radio warning system for hazard avoidance

"The transmitter generates and transmits a radio warning signal that carries a digital data sequence that includes information concerning a particular potential hazardous condition ... Through the use of digital encoding techniques, ... System users are

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equipped with a receiver that receives the radio warning signal and interprets the digital data ..."

Darnall Patent, U.S. Pat. No. 6,417,782 B1,

Title: Driver's Emergency Alert System

"A method for alerting a moving vehicle of an approaching emergency vehicle comprising: transmitting a first emergency signal from an emergency vehicle; receiving the first emergency signal in a relay station; transmitting a second emergency signal from the relay station; receiving the second emergency signal in the moving vehicle; and alerting the driver of the moving vehicle that the emergency vehicle is approaching."

Every claim in the Darnall Patent employs relays and/or Global Position System (GPS) technology; This invention employs analog-based, FM radio technology. GPS receivers currently cost twenty to fifty times as much as the EVE Icon-Receiver and EVE Mini-

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Receiver. The Darnall Patent is not cost-effective; This invention is.

All of the relevant prior arts' innovations focused on increasing the transmission signals' capabilities, to increase information to the non-emergency vehicles; The EVE Transmitter focuses on decreasing/reigning in the transmission signal with an accelerometer and directional antenna, to decrease the number of non-emergency vehicles being alerted. No related prior art has ever done this.

All of the relevant prior arts' transmission signals are transmitted based upon the distance between the non-emergency vehicles and the emergency vehicle; The EVE Transmitter's transmission signals are transmitted based upon the time between the non-emergency vehicles and the arrival of the emergency

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vehicle, with the use of an accelerometer. No related prior art has ever done this.

No prior art has invented an inexpensive, cost-effective and therefore practical solution to reducing the accidents caused by emergency vehicles. Only this invention, to date, is a practical solution with a system of dedicated-channel, analog-based, FM radio devices.

SUMMARY OF THE INVENTION

Accordingly, it is an object of the present invention to provide an EVE Transmitter which is relatively inexpensive to manufacture, durable in structure, requires no maintenance if the emergency vehicle's power supply is used, requires little maintenance if the emergency vehicle's power supply is not used,

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is quick and easy to install, efficient in operation and operates automatically if/when desired.

Another object of the present invention is to provide EVE Mini-
Receivers that are extremely inexpensive to manufacture, durable
in structure, require no maintenance, extremely quick and easy
to install, efficient in operation and operate automatically.

Another object of the present invention is to provide EVE
Traffic-receivers that are inexpensive to adapt to unused
existing traffic lights, relatively inexpensive to add to newly
manufactured traffic lights, durable in structure, require
little maintenance, efficient in operation and operate
automatically.

Another object of the present invention is to increase response
times for ambulances to victims and then to hospitals.

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Another object of the present invention is to increase response times for fire trucks to victims and reduce property damage.

Another object of the present invention is to increase response times to crime victims and reduce property loss.

Another object of the present invention is to increase safety at dangerous school bus stops.

Another object of the present invention is to reduce emergency vehicle caused accidents, injuries and fatalities.

Another object of the present invention is to reduce accidents in high-speed pursuits (the only non-emergency vehicle moving would be the suspect).

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Another object of the present invention is to reduce railroad crossing train and non-emergency vehicle and pedestrian collisions, especially where crossing gates are not erected.

Another object of the present invention is to enable unmarked law enforcement, secret service, National Guard and funeral processions clear passage.

Another object of the present invention is to enable an immobilized area from a police helicopter.

Another object of the present invention is to enable helicopter ambulances to clear a landing area.

Another object of the present invention is to enable airport air traffic control to clear freeways for emergency landings.

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Another object of the present invention is to enable citywide non-emergency vehicle immobilization from a local radio station such as for the touch down of a tornado.

Another object of the present invention is to enable the deaf, hard of hearing and drivers with windows up, air-conditioning on high, with radios on, to safely pull over their non-emergency vehicles.

The current system for clearing the path of emergency vehicles with the use of sirens and flashers is inferior to the current system with the addition of the present invention. Other objects, features and advantages of the present invention will become apparent from the following description when taken in conjunction with the accompanying drawings.

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BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is an illustrated aerial view of the relative ineffectiveness of an emergency vehicle's ability to warn non-emergency vehicles of its approach;

FIG. 2 is an illustrated aerial view of the effectiveness of an emergency vehicle's ability to warn non-emergency vehicles of its approach employing this invention;

FIG. 3 is an applied and illustrated view of this invention consisting of the emergency vehicle's EVE Transmitter transmitting to the non-emergency vehicle's EVE Mini-Receiver and the EVE Traffic-Receiver;

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FIG. 4 is an illustration and a block diagram of the major components of the EVE Transmitter according to the present invention;

FIG. 5 is an enlarged, perspective view of the EVE Transmitter according to the present invention;

FIG. 6 is an applied view with an illustration and a block diagram of the major components of the EVE Mini-Receiver according to the present invention;

FIG. 7 is an enlarged, perspective view of the EVE Mini-Receiver according to the present invention;

FIG. 8 is an illustration with a block diagram of the major components of the factory installed EVE Icon-Receiver according to the present invention;

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FIG. 9 is an illustration of an EVE Traffic-Receiver housing according to the present invention.

FIG. 10 is an illustration of the EVE Transmitter's transmission pattern according to the present invention.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

Referring to FIG. 3, an emergency vehicle environment is created with the use of the three devices named the EVE Transmitter, the EVE Mini-Receiver and the EVE Traffic-Receiver. The EVE Transmitter is adhered externally to the emergency vehicle in proximity to the vehicle's siren, whistle, etc, or internally on the dashboard. The EVE Mini-Receiver is adhered to the dashboard or windshield on the non-emergency vehicle. The EVE Traffic-Receiver is housed inside a conventional traffic light. When the emergency vehicle actuates its siren the EVE Transmitter

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automatically transmits a signal on a preset carrier frequency already designated for emergency communications with a factory preset signal range that does not carry any appreciable distance beyond the requirements of the emergency vehicle's necessitation. The accelerometer increases the signal's range the faster the emergency vehicle is moving and decreases the signal range the slower the emergency vehicle is moving. The EVE Mini-Receiver then receives the signal and actuates its strobe light that the driver of the non-emergency vehicle then unmistakably sees on the dashboard, windshield or instrument panel (EVE Icon-Receiver). The EVE Traffic-Receiver situated at historically dangerous intersections, crowded venues, etc., also receives the signal and actuates its blinking blue traffic light for drivers that do not yet have EVE Mini-Receiver, inoperative EVE Mini-Receiver, pedestrian railroad crossings, etc. The drivers then proceed to safely pull their non-emergency vehicles over and out of the way of the emergency vehicle.

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Referring to FIG. 4, this will be understood by those skilled in the art that the EVE Transmitter's printed circuit board of the EVE Transmitter is of conventional construction and is divulged in prior art. With the EVE Transmitter mounted on the exterior of the emergency vehicle (such as the light bar), the on-auto-off switch is switched to the auto (automatic) position. The emergency vehicle's siren is then actuated by the emergency vehicle's operator, as it normally would be. The siren actuates the condenser microphone. The condenser microphone actuates the EVE Transmitter. The accelerometer adjusts the signals range. The EVE Transmitter transmits the signal via the internal directional antenna. The LED is for indicating a low battery power supply.

Referring to FIG. 5, the on-auto-off switch 20 is switched to the auto position when the EVE Transmitter is adhered with a

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peel and stick perimeter 16 externally to the emergency vehicle enabling the EVE Transmitter to automatically actuate when the siren is actuated. The condenser microphone 18 is actuated by the actuation of the siren, unless it is overridden by hardwiring from the vehicle's siren switch at input port 19. The condenser microphone 18 then actuates the EVE Transmitter mounted within the upper cover shell 14. The EVE Transmitter transmits the signal forward via the internal directional antenna 12. The accelerometer 22 automatically adjusts the signal's range when the on-off switch 23 is on. The accelerometer extension port is 21. The LED 13 is for indicating a low power supply. The battery lid cover 15 on the battery chamber is for accessing batteries. The external power supply input port 17 is for connecting a power cord to the vehicle's power supply, overriding the batteries as a power source.

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Title of Invention: E.V.E. emergency vehicle environment

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Mounting the EVE Transmitter wholly externally affords extremely quick and easy installation, but requires battery replacements 15. Mounting the EVE Transmitter internally, eliminates battery maintenance and enables manual operation of the on-auto-off switch 20, but requires installation. Another option is to mount the EVE Transmitter externally with the power cord connecting the external power supply input port 17, to the vehicle's power supply via the power feeding the flashers and/or siren. The best mode is internally.

Referring to FIG. 6, this will be understood by those skilled in the art that the receiver's printed circuit board is of conventional construction and is divulged in prior art. With the EVE Mini-Receiver, the internal omni-directional antenna receives the EVE Transmitter's signal that actuates the receiver. The receiver actuates the strobe light that alerts the non-emergency vehicle's driver to pull over. When the test

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The above confidential information is Witnessed and Understood:

Ashley Steel Date: 8-07-04
Sue Cospery Date: 8/9/04

Group Art Unit: 2632

Examiner: Daniel Previl

Invention Disclosure

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switch button is depressed, if the strobe light does not actuate, the battery is low or the unit needs replacing.

Referring to FIG. 7, the EVE Mini-Receiver 24 is adhered with a peel and stick rectangular pad 26 (backside) to the non-emergency vehicle's dashboard or windshield. Upon receipt of the EVE Transmitter's signal the strobe light 25 is actuated. The test switch button 27 is to make sure the unit is functioning properly.

Referring to FIG. 8, the installed EVE Icon-Receiver is the EVE Mini-Receiver installed at the factory as original equipment and is hidden within the dashboard. The bottom cover plate, antennas, test switch and battery terminal connectors are omitted. An antenna cable conjoins the non-emergency vehicle's radio antenna. The EVE Icon-Receiver's power supply conjoins the non-emergency vehicle's radio's power supply. The strobe light

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is mounted in the vehicle's instrument panel with wire cable
extending to the EVE Icon-Receiver.

Referring to FIG. 9, the EVE Traffic-Receiver housing can take
the form of conventional traffic lights 29 and have blinking
blue lights 28 or use the round beacon housing 31 and have
rotating blue lights or blue strobe lights 30. The EVE Traffic-
Receivers in either housing can be added to a red-yellow-green
traffic light, blinking red/yellow, 4-way, 2-way, stand-alone,
post, pole, etc.

Referring to FIG. 10, the EVE Transmitter employs a directional
antenna so that the signal is only sent to non-emergency
vehicles in the path of the emergency vehicle 33 - a sector
(pie-shape) of the transmission circle. A transmitter without a
signal direction alerts every non-emergency vehicle within the
emergency vehicle's radius 32 - the entire area of the circle,

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which are at least three times as many unnecessary alerts. This substantially reduces the value of necessary alerts. The over-alert, no signal direction problem is analogous to the current ignoring of sirens.

The accelerometer of the EVE Transmitter further reduces the number of non-emergency vehicles being unnecessarily alerted by increasing or decreasing the signals strength. The arc of the sector 33 (the signal) then either moves farther away or closer to, the circle's center (signal's origin).

It is to be understood that the drawings are designed for purpose of illustration only, and are not intended as a definition of the limits and scope of the invention disclosed.

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